

## PATENT ABSTRACTS OF JAPAN

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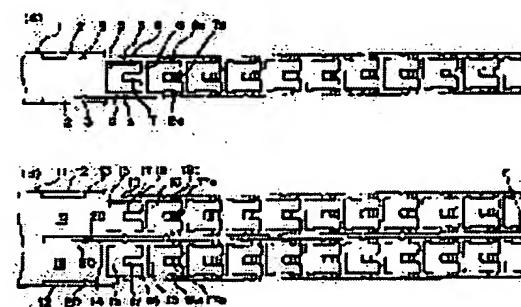
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**(54) RIBBON SPRING FOR ONE-WAY CLUTCH AND MANUFACTURE THEREOF**

**(57)Abstract:**

**PURPOSE:** To provide a ribbon spring for an one-way clutch and a manufacture thereof wherein burrs can be prevented from being generated in manufacture.

**CONSTITUTION:** Both side edges 2, 2 of a thin and band-like plate member 1 cut by a slitter are cut away by a presser. Next, a window and a tongue part 7 are formed by stamping out the plate member 11 by the presser. And then, a bent part 7a is formed on the window 5 and the tongue part 7. Accordingly burrs generated on both side edges of the plate member 11 when both side edges cut by the slitter are removed from the plate member 11 because both side edges 2, 2 are cut away by the presser.



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## CLAIMS

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### [Claim(s)]

[Claim 1] Two or more windows in which an engaging member arranged between an outer ring of spiral wound gasket and an inner ring is inserted.

Tongue which energizes the above-mentioned engaging member to one way.

With a pressing machine, pierce a center section of the band-like plate which is a manufacturing method of a ribbon spring for one way clutches provided with the above, and excised a edges-on-both-sides part of a plate which extends in band-like with a pressing machine and from which the above-mentioned edges-on-both-sides part was excised, and A window, Tongue projected to the above-mentioned lengthwise direction from a side window frame prolonged in a transverse direction which intersects a lengthwise direction where the above-mentioned plate extends is formed, a vertical window frame and the above-mentioned tongue which are prolonged in the above-mentioned lengthwise direction are made crooked to an abbreviated perpendicular direction to a flat surface where the above-mentioned plate extends, and a flection is formed in the above-mentioned vertical window frame and tongue.

[Claim 2] In a manufacturing method of a ribbon spring for one way clutches of the invention according to claim 1, A manufacturing method of a ribbon spring for one way clutches characterized by excising with a pressing machine so that a crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate about a edges-on-both-sides part of a plate which extends in the above-mentioned band-like one may be formed.

[Claim 3] Two or more windows in which an engaging member arranged between an outer ring of spiral wound gasket and an inner ring is inserted.

Tongue which energizes the above-mentioned engaging member to one way.

Are a manufacturing method of a ribbon spring for one way clutches provided with the above, excise a edges-on-both-sides part of a plate which extends in band-like with a pressing machine, and a portion between edges-on-both-sides parts of the above-mentioned band-like plate is excised to slit shape of a lengthwise direction with a pressing machine, At least one slit shape removal part prolonged in a lengthwise direction where the above-mentioned plate is prolonged is formed, With a pressing machine, form a lobe of a double row prolonged in a lengthwise direction where the above-mentioned band-like plate is prolonged, pierce simultaneously two or more center sections of the lobe of the above-mentioned double row, and Two or more windows, Two or more tongues projected to the above-mentioned lengthwise direction from a side window frame prolonged in a transverse direction which intersects a lengthwise direction where the above-mentioned plate is prolonged are formed, A vertical window frame and the above-mentioned tongue which are prolonged in the above-mentioned lengthwise direction are made crooked to an abbreviated perpendicular direction to a flat surface where the above-mentioned plate extends, and a flection is formed in the above-mentioned vertical window frame and tongue.

[Claim 4] In a manufacturing method of the ribbon spring for one way clutches according to claim 3, Excise with a pressing machine so that a crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate about a edges-on-both-sides part of a plate which extends in the above-mentioned band-like one may be formed, and it excises to slit shape containing heights which projected a portion between edges-on-both-sides parts of the above-mentioned band-like plate in a transverse direction. A manufacturing method of a ribbon spring for one way clutches forming the slit shape above-mentioned removal part, and forming a crevice which became depressed in a transverse direction at both sides of the above-mentioned lobe.

[Claim 5] Two or more windows in which an engaging member arranged between an outer ring of spiral wound gasket and an inner ring is inserted.

Tongue which energizes the above-mentioned engaging member to one way.

A edges-on-both-sides part which is the ribbon spring for one way clutches provided with the above, and sandwiches the above-mentioned window is formed by excising a lateral part which adjoined the outside of the above-mentioned edges-on-both-sides part with a pressing machine.

[Claim 6] A ribbon spring for one way clutches, wherein a crevice which became depressed inside in the above-mentioned edges-on-both-sides part is formed in the ribbon spring for one way clutches according to claim 5.

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[Translation done.]

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

[Industrial Application] This invention relates to a ribbon spring for one way clutches, and a manufacturing method for the same.

**[0002]**

[Description of the Prior Art] As a manufacturing method of this kind of ribbon spring for one way clutches, conventionally, By a slitting machine, cut a broad plate long and slender and it is used as the band-like plate 50, Next, as it pierces introducing the above-mentioned band-like plate 50 into a precision pressing machine, and passing it around and is shown in drawing 4 (A), form the window 51 and the tongue 52, and further, The frames 53 and 53 and the above-mentioned tongue 52 which sandwich the above-mentioned window 51 are made crooked with the above-mentioned precision pressing machine, in the direction which intersects perpendicularly with the above-mentioned plate 50, as shown in drawing 4 (C) and (B), and there is the method of forming the flections 53a and 52a in the above-mentioned frame 53 and the tongue 52.

**[0003]**

[Problem(s) to be Solved by the Invention] however -- the manufacturing method of the above-mentioned conventional ribbon spring for one way clutches -- the above -- when a slitting machine cuts a broad plate long and slender, a barricade occurs, and a barricade arises in the edges-on-both-sides part of the above-mentioned band-like plate 50. For this reason, when the above-mentioned band-like plate 50 is introduced into the above-mentioned precision pressing machine and passes around, there is a problem that the barricade produced in the above-mentioned edges-on-both-sides part may be caught in the guide part of a passing <a thing> on device, etc., and distortion may arise in the completed ribbon spring.

[0004] When the above-mentioned barricade is caught, the problem that it becomes less smooth and the window 51 by a pressing machine and the formation accuracy of the tongue 52 worsen also has delivery.

[0005] Then, the purpose of this invention is to provide a ribbon spring for one way clutches which can prevent a barricade occurring at the time of manufacture, and a manufacturing method for the same.

[Means for Solving the Problem] In order to attain the above-mentioned purpose, a manufacturing method of a ribbon spring for one way clutches of the invention according to claim 1, In a manufacturing method of a ribbon spring for one way clutches which has two or more windows in which an engaging member arranged between an outer ring of spiral wound gasket and an inner ring is inserted, and the tongue which energizes the above-mentioned engaging member to one way, With a pressing machine, pierce a center section of the band-like plate which excised a edges-on-both-sides part of a plate which extends in band-like with a pressing machine and from which the above-mentioned edges-on-both-sides part was excised, and A window, Tongue projected to the above-

mentioned lengthwise direction from a side window frame prolonged in a transverse direction which intersects a lengthwise direction where the above-mentioned plate extends is formed, A vertical window frame and the above-mentioned tongue which are prolonged in the above-mentioned lengthwise direction are made crooked to an abbreviated perpendicular direction to a flat surface where the above-mentioned plate extends, and it is characterized by forming a flection in the above-mentioned vertical window frame and tongue.

[0006]A manufacturing method of a ribbon spring for one way clutches of an invention of claim 2, In a manufacturing method of the ribbon spring for one way clutches according to claim 1, it is characterized by excising with a pressing machine so that a crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate about a edges-on-both-sides part of a plate which extends in the above-mentioned band-like one may be formed.

[0007]A manufacturing method of a ribbon spring for one way clutches of an invention of claim 3, In a manufacturing method of a ribbon spring for one way clutches which has two or more windows in which an engaging member arranged between an outer ring of spiral wound gasket and an inner ring is inserted, and the tongue which energizes the above-mentioned engaging member to one way, Excise a edges-on-both-sides part of a plate which extends in band-like with a pressing machine, and a portion between edges-on-both-sides parts of the above-mentioned band-like plate is excised to slit shape of a lengthwise direction with a pressing machine, At least one slit shape removal part prolonged in a lengthwise direction where the above-mentioned plate is prolonged is formed, With a pressing machine, form a lobe of a double row prolonged in a lengthwise direction where the above-mentioned band-like plate is prolonged, pierce simultaneously two or more center sections of the lobe of the above-mentioned double row, and Two or more windows, Two or more tongues projected to the above-mentioned lengthwise direction from a side window frame prolonged in a transverse direction which intersects a lengthwise direction where the above-mentioned plate is prolonged are formed, A vertical window frame and the above-mentioned tongue which are prolonged in the above-mentioned lengthwise direction are made crooked to an abbreviated perpendicular direction to a flat surface where the above-mentioned plate extends, and it is characterized by forming a flection in the above-mentioned vertical window frame and tongue.

[0008]A manufacturing method of a ribbon spring for one way clutches of an invention of claim 4, In a manufacturing method of the ribbon spring for one way clutches according to claim 3, It excises with a pressing machine so that a crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate about a edges-on-both-sides part of a plate which extends in the above-mentioned band-like one may be formed, It is characterized by excising to slit shape containing heights which projected a portion between edges-on-both-sides parts of the above-mentioned band-like plate in a transverse direction, forming the slit shape above-mentioned removal part, and forming a crevice which became depressed in a transverse direction in both sides of the above-mentioned lobe.

[0009]A ribbon spring for one way clutches of an invention of claim 5, In a ribbon spring for one way clutches which has two or more windows in which an engaging member arranged between an outer ring of spiral wound gasket and an inner ring is inserted, and the tongue which energizes the above-mentioned engaging member to one way, A edges-on-both-sides part which sandwiches the above-mentioned window is characterized by being formed by excising a lateral part which adjoined the outside of the above-mentioned edges-on-both-sides part with a pressing machine.

[0010]A ribbon spring for one way clutches of an invention of claim 6 is characterized by forming a crevice which became depressed inside in the above-mentioned edges-on-both-sides part in the ribbon spring for one way clutches according to claim 5.

[0011]

[Function]According to the manufacturing method of the ribbon spring of an invention of claim 1, even if the barricade has occurred in the above-mentioned edges-on-both-sides part when the

above-mentioned band-like plate is formed of a slitting machine since the edges-on-both-sides part of the plate which extends in band-like is excised with a pressing machine, the above-mentioned barricade is removed at the time of excision by the above-mentioned pressing machine.

[0012]Therefore, at the time of delivery of the above-mentioned band-like plate, it is lost that a barricade is caught and a band-like plate is not distorted. Since delivery of the above-mentioned band-like plate becomes smooth, the position by which a window and tongue are pierced with a pressing machine becomes exact.

[0013]When excising the edges-on-both-sides part of the plate which extends in the above-mentioned band-like one with a pressing machine according to the manufacturing method of the ribbon spring of an invention of claim 2, the crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate is formed. Therefore, a lateral crevice is formed in the vertical window frame of a ribbon spring, the flexural rigidity of a ribbon spring becomes small, and it becomes easy to bend to ring shape. Therefore, according to the invention of claim 2, a ribbon spring with easy inclusion to a one way clutch is manufactured. Since the flexural rigidity of a ribbon spring becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state improves. So that the excision leader or excision trailer which excises the edges-on-both-sides part of the plate which extends in the above-mentioned band-like one with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice, One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction will be lost. That is, tolerance level [ as opposed to a position gap of the above-mentioned removal part only in the part to which the above-mentioned crevice has become depressed in the transverse direction ] spreads.

[0014]Even if the barricade has occurred in the above-mentioned edges-on-both-sides part when the above-mentioned band-like plate is formed of a slitting machine since the manufacturing method of the ribbon spring of an invention of claim 3 excises the edges-on-both-sides part of the plate which extends in band-like with a pressing machine, the above-mentioned barricade is removed at the time of excision by the above-mentioned pressing machine. Therefore, at the time of delivery of the above-mentioned band-like plate, it is lost that a barricade is caught and a band-like plate is not distorted. Since delivery of the above-mentioned band-like plate becomes smooth, the position by which a window and tongue are pierced with a pressing machine becomes exact.

[0015]The invention of claim 3 excises between the edges-on-both-sides parts of the above-mentioned band-like plate to slit shape with a pressing machine, forms at least one slit shape removal part prolonged in the direction to which the above-mentioned plate extends, and forms simultaneously the lobe of the double row prolonged in the direction to which the above-mentioned band-like plate extends. And since a window and tongue are formed in the lobe of this double row and two or more ribbon springs are formed simultaneously, two or more ribbon springs are manufactured simultaneously, and the completed amount per unit time improves.

[0016]When the invention of claim 4 excises the edges-on-both-sides part of the plate which extends in band-like with a pressing machine in the invention of claim 3, The crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate is formed, slit shape containing the heights which projected the slit shape removal part in the transverse direction is used, and the crevice which became depressed in the transverse direction in the above-mentioned lobe is formed. Therefore, a lateral crevice is formed in the vertical window frame of a ribbon spring, the flexural rigidity of a ribbon spring becomes small, and it becomes easy to bend to ring shape. Therefore, the inclusion to a one way clutch becomes easy. Since flexural rigidity becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state improves. So

that the excision leader or excision trailer which excises the portion between the edges-on-both-sides part of the plate which extends in the above-mentioned band-like one, and the above-mentioned edges-on-both-sides part with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice, One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction will be lost.

[0017]The edges-on-both-sides part into which the ribbon spring of an invention of claim 5 inserts a window is formed by excising the lateral part which adjoined the outside of the above-mentioned edges-on-both-sides part with a pressing machine. Therefore, even if the above-mentioned lateral part has a barricade, the above-mentioned barricade is removed at the time of excision by the above-mentioned pressing machine.

[0018]That is, since the barricade is removed by the pressing machine at the time of the manufacture, connection of the barricade at the time of manufacture does not produce the above-mentioned ribbon spring. Therefore, the distortion at the time of manufacture resulting from connection of the above-mentioned barricade and degradation of process tolerance are prevented.

[0019]Since the crevice hollow inside is formed in the above-mentioned edges-on-both-sides part, the flexural rigidity of a ribbon spring becomes small and it becomes easy to bend the ribbon spring of an invention of claim 6 to ring shape. Therefore, the inclusion to a one way clutch becomes easy. Since flexural rigidity becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state improves. So that the excision leader or excision trailer which excises the above-mentioned lateral part with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice, One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction will be lost. Therefore, it prevents a barricade occurring in a edges-on-both-sides part.

[0020]

[Example]Hereafter, the example of a graphic display of this invention explains in detail.

[0021]The example of the manufacturing method of the ribbon spring for one way clutches of this invention is described referring to drawing 1 (A). This example excises the edges-on-both-sides parts 2 and 2 with a pressing machine, passing around the plate 1 which extends in band-like [ which was first cut long and slender by the slitting machine ] rightward [ of drawing 1 (A) ]. Excision by this pressing machine is performed so that the crevices 3 and 3 which became depressed inside from the outside of the direction to which the plate 1 extends in the above-mentioned plate 1, and a right-angled transverse direction may be formed.

[0022]Next, the center section of the plate 1 from which the above-mentioned edges-on-both-sides parts 2 and 2 were excised is pierced with a pressing machine, and the tongue 7 projected to the lengthwise direction from the window 5 and the side window frame 6 prolonged in the above-mentioned transverse direction is formed.

[0023]Next, the vertical window frames 8 and 8 and the tongue 7 which are prolonged in a lengthwise direction are made perpendicularly crooked so much at the flat surface at which the plate 1 extends, and the flections 8a, 8a, and 7a are formed in the above-mentioned vertical window frames 8 and 8 and the tongue 7.

[0024]Two or more engaging members (not shown) arranged between an outer ring of spiral wound gasket and an inner ring are inserted in the above-mentioned window 5, and the above-mentioned engaging member is energized by the engaging direction by the above-mentioned flection 7a.

[0025]According to the above-mentioned manufacturing method, even if the barricade has occurred

in the edges-on-both-sides part 2 when the plate 1 is formed of a slitting machine since the edges-on-both-sides part 2 of the plate 1 which extends in band-like is excised with a pressing machine, the above-mentioned barricade is removed at the time of excision by the above-mentioned pressing machine. Therefore, at the time of passing <a thing> on of the above-mentioned band-like plate 1, it is lost that a barricade is caught in the inside of the proposal of a feed gear, etc., and the band-like plate 1 can be prevented from being distorted. Since delivery of the above-mentioned band-like plate 1 becomes smooth, the punching position of the window 5 by a pressing machine and the tongue 7 can be made exact.

[0026] Since excision by the above-mentioned pressing machine is performed so that the crevices 3 and 3 which became depressed inside from the outside of the direction to which the plate 1 extends in the above-mentioned plate 1, and a right-angled transverse direction may be formed, the crevice 3 which became depressed in the vertical window frame 8 of the completed ribbon spring at the transverse direction inside is formed. Therefore, the flexural rigidity of a ribbon spring becomes small and it becomes easy to bend to ring shape. Therefore, according to the above-mentioned example, the inclusion to a one way clutch can form an easy ribbon spring. Since the flexural rigidity of a ribbon spring becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state improves.

[0027] So that the excision leader or excision trailer which excises the edges-on-both-sides part 2 of the plate 1 which extends in the above-mentioned band-like one with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice 3 and an excision trailer and the following excision leader may lap in the above-mentioned crevice 3, One by one, if the above-mentioned edges-on-both-sides part 2 is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the portion to excise in every direction are lost, and generating of a barricade can be prevented.

[0028] Next, the 2nd example of the manufacturing method of the ribbon spring for one way clutches of this invention is described, referring to drawing 1 (B).

[0029] This 2nd example excises the edges-on-both-sides parts 12 and 12 with a pressing machine, passing around the plate 11 which extends in band-like [ which was first cut long and slender by the slitting machine ] rightward [ of drawing 1 (B) ]. This excision is performed so that the crevices 13 and 13 which became depressed inside from the outside of the direction to which the plate 11 extends in the above-mentioned plate 11, and a right-angled transverse direction may be formed.

[0030] and it excises to the slit shape containing the heights which projected between excision of the above-mentioned edges-on-both-sides parts 12 and 12, simultaneously the edges-on-both-sides parts 12 and 12 of the above-mentioned band-like plate 11 in the transverse direction with the pressing machine, and the slit shape removal part 14 prolonged in the lengthwise direction where the above-mentioned plate 11 is prolonged is formed. By forming this slit shape removal part 14, the lobes 19 and 19 of two rows by which the crevices 13 and 20 hollow in the transverse direction were formed in both sides are formed.

[0031] Next, the center section of the above-mentioned lobe 19 is pierced with a pressing machine, and the tongue 17 projected to the lengthwise direction from the window 15 and the side window frame 16 prolonged in a transverse direction is formed.

[0032] Next, the vertical window frame 18 and the tongue 17 which are prolonged in a lengthwise direction are made crooked to an abbreviated perpendicular direction to the flat surface where the above-mentioned plate 11 extends, and the flections 18a and 17a are formed in the vertical window frame 18 and the tongue 17.

[0033] According to the manufacturing method of the 2nd example of the above, among the edges-on-both-sides parts 12 and 12 of the band-like plate 11, Since form the slit shape removal part 14 prolonged in a lengthwise direction, the lobes 19 and 19 of two rows are formed simultaneously, the windows 15 and 15 and the tongues 17 and 17 are formed in these lobes 19 and 19 of two rows and two ribbon springs are formed simultaneously, the completed amount per unit time can be raised.

Therefore, the cost cut of a ribbon spring can be aimed at.

[0034]The elements on larger scale of the ribbon spring for one way clutches manufactured in the 2nd example of the above are shown in drawing 2 (A). The ribbon spring shown in drawing 2 (A) is an example of the ribbon spring of this invention. This ribbon spring is formed when the side edge part 12 of the outside of the vertical window frames 18 and 18 and the slit shape removal part 14 excise with a pressing machine. Therefore, even if a barricade is in the side edge part 12 of the above-mentioned outside, the above-mentioned barricade is removed at the time of excision by the above-mentioned pressing machine. That is, since the barricade is removed by the pressing machine at the time of the manufacture, connection of the barricade at the time of manufacture does not produce the above-mentioned ribbon spring. Therefore, the distortion at the time of manufacture resulting from connection of the above-mentioned barricade and degradation of process tolerance can be eliminated, and dimensional accuracy becomes high. Since the crevices 13 and 20 are formed in the vertical window frames 18 and 18, flexural rigidity becomes small and it becomes easy to bend the above-mentioned ribbon spring to ring shape. Therefore, the inclusion to a one way clutch becomes easy. Since flexural rigidity becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state can be improved. The excision leader or excision trailer which excises the portion between the edges-on-both-sides part 12 of the plate 11 which extends in the above-mentioned band-like one, and the above-mentioned edges-on-both-sides parts 12 and 12 with a pressing machine is made into the convex configuration corresponding to the above-mentioned crevices 13 and 20, So that an excision trailer and the following excision leader may lap in the above-mentioned crevices 13 and 20, One by one, if the above-mentioned edges-on-both-sides part 12 and the slit shape removal part 14 are excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the portions 12 and 14 to excise in every direction are lost, and generating of a barricade can be prevented.

[0035]Although only the one above-mentioned slit shape removal part 14 is formed and two ribbon springs were simultaneously produced in the manufacturing method of the 2nd example of the above, the two or more above-mentioned slit shape removal parts are formed, and it may be made to produce three or more ribbon springs simultaneously. In this case, the completed amount per unit time of a ribbon spring can be raised further.

[0036]Although excision of the edges-on-both-sides parts 12 and 12 and formation of the slit shape removal part 14 were simultaneously performed in the manufacturing method of the 2nd example of the above, The edges-on-both-sides parts 12 and 12 are excised, after passing the plate 11 around, the slit shape removal part 14 may be formed, and the slit shape removal part 14 may be formed conversely, and after passing the plate 11 around, the edges-on-both-sides parts 12 and 12 may be excised.

[0037]In the 1st and 2nd example of the above, when the delivery phase of the plate 11 was the same, performed formation of the flections 8a and 18a of the vertical window frames 8 and 18, and formation of the flections 7a and 17a of the tongues 7 and 17, but, the delivery phases of the plate 11 differ formation of the flection of a vertical window frame, and formation of the flection of tongue -- it may carry out for solving.

[0038]In the above-mentioned example, the crevices 13 and 20 formed in a vertical window frame were made into the inclined straight line and the crevice across which a curve curve faces, as shown in drawing 3 (F), but it may be made semicircle shape as shown in drawing 3 (A). As shown in drawing 3 (B), one side may make the above-mentioned crevice the right angled triangle shape incised right-angled, and as shown in drawing 3 (C), another side may make the above-mentioned crevice the right angled triangle shape incised right-angled. As shown in drawing 3 (D), it may be made the shape of a half-ellipse. As shown in drawing 3 (E), the above-mentioned crevice may be made into a rectangle.

[0039]As shown in drawing 2 (B), the slit for window pitch adjustment may be formed between

windows.

[0040]As the dashed line showed at the right end of drawing 1 (B), when one end cut shape of the two ribbon springs is changed with another side, the difference of the above-mentioned end cut shape can be used for pursuit of a manufacture lot.

[0041]

[Effect of the Invention]As mentioned above, so that clearly the manufacturing method of the ribbon spring for one way clutches of an invention of claim 1, Even if a barricade occurs in the above-mentioned edges-on-both-sides part when the above-mentioned band-like plate is formed of a slitting machine since the edges-on-both-sides part of the plate which extends in band-like is excised with a pressing machine, the above-mentioned barricade is removable at the time of excision by the above-mentioned pressing machine.

[0042]Therefore, at the time of delivery of the above-mentioned band-like plate, a barricade can be prevented from being caught and a band-like plate can be prevented from being distorted. Since delivery of the above-mentioned band-like plate becomes smooth, the position which a window and tongue pierce with a pressing machine can be made exact.

[0043]The manufacturing method of the ribbon spring of an invention of claim 2 excises the edges-on-both-sides part of the plate which extends in band-like so that the crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate may be formed with a pressing machine. Therefore, it can be made easy to form a lateral crevice in the vertical window frame of a ribbon spring, and for the rigidity of a ribbon spring to become small, and to bend to ring shape. Therefore, according to the invention of claim 2, the inclusion to a one way clutch can manufacture an easy ribbon spring. According to the above-mentioned invention, since the rigidity of a ribbon spring becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state can be improved. So that the excision leader or excision trailer which excises the edges-on-both-sides part of the plate which extends in the above-mentioned band-like one with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice, One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction can be eliminated.

[0044]Even if the barricade has occurred in the above-mentioned edges-on-both-sides part when the above-mentioned band-like plate is formed of a slitting machine since the edges-on-both-sides part of the plate which extends in band-like is excised with a pressing machine, the manufacturing method of the ribbon spring of an invention of claim 3 can be removed when excising the above-mentioned barricade with the above-mentioned pressing machine. Therefore, at the time of delivery of the above-mentioned band-like plate, a barricade can be prevented from being caught and a band-like plate can be prevented from being distorted. Since delivery of the above-mentioned band-like plate becomes smooth, the position which pierces a window and tongue with a pressing machine can be made exact.

[0045]The invention of claim 3 excises between the edges-on-both-sides parts of the above-mentioned band-like plate to slit shape with a pressing machine, forms at least one slit shape removal part prolonged in the direction to which the above-mentioned plate extends, and forms simultaneously the lobe of the double row prolonged in the direction to which the above-mentioned band-like plate extends. And since a window and tongue are formed in the lobe of this double row and two or more ribbon springs are formed simultaneously, the completed amount per unit time can be improved.

[0046]The invention of claim 4 excises the edges-on-both-sides part of the plate which extends in band-like so that the crevice which became depressed inside from the outside of the above-mentioned transverse direction in the plate may be formed in the invention of claim 3 with a

pressing machine, It excises to the slit shape containing the heights which projected the portion between the edges-on-both-sides parts of the above-mentioned band-like plate in the transverse direction, a slit shape removal part is formed, and the crevice which became depressed in the transverse direction in both sides of the above-mentioned lobe is formed. Therefore, according to the invention of claim 4, a lateral crevice is formed in the vertical window frame of a ribbon spring, flexural rigidity of a ribbon spring can be made small, and it becomes easy to bend to ring shape. Therefore, according to the invention of claim 4, the inclusion to a one way clutch can manufacture an easy ribbon spring. Since the flexural rigidity of a ribbon spring becomes small, the overhang to the diameter direction after including in a one way clutch can be suppressed, and the deviation from circular form of the ribbon spring in an inclusion state can be raised. So that the excision leader or excision trailer which excises the portion between the edges-on-both-sides part of the plate which extends in the above-mentioned band-like one, and the above-mentioned edges-on-both-sides part with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice, One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction can be eliminated.

[0047]The edges-on-both-sides part into which the ribbon spring of an invention of claim 5 inserts a window is formed by excising the lateral part which adjoined the outside of the above-mentioned edges-on-both-sides part with a pressing machine. Therefore, even if the above-mentioned lateral part has a barricade, the above-mentioned barricade is removable at the time of excision by the above-mentioned pressing machine. That is, since the above-mentioned ribbon spring can remove a barricade with a pressing machine at the time of the manufacture, connection of the barricade at the time of manufacture does not produce it. Therefore, the distortion at the time of manufacture resulting from connection of the above-mentioned barricade and degradation of process tolerance can be prevented.

[0048]Since the crevice hollow inside is formed in the above-mentioned edges-on-both-sides part, the flexural rigidity of a ribbon spring becomes small and it becomes easy to bend the ribbon spring of an invention of claim 6 to ring shape. Therefore, the inclusion to a one way clutch can be made easy, and it is \*\*. Since flexural rigidity becomes small, the overhang to the diameter direction after including in a one way clutch can be suppressed, and the deviation from circular form in an inclusion state can be improved. So that the excision leader or excision trailer which excises the above-mentioned lateral part with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice, One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction will be lost. Therefore, a barricade can be prevented from occurring in a edges-on-both-sides part.

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**TECHNICAL FIELD**

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[Industrial Application] This invention relates to a ribbon spring for one way clutches, and a manufacturing method for the same.

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**PRIOR ART**

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[Description of the Prior Art]As a manufacturing method of this kind of ribbon spring for one way clutches, conventionally, By a slitting machine, cut a broad plate long and slender and it is used as the band-like plate 50, Next, as it pierces introducing the above-mentioned band-like plate 50 into a precision pressing machine, and passing it around and is shown in drawing 4 (A), form the window 51 and the tongue 52, and further, The frames 53 and 53 and the above-mentioned tongue 52 which sandwich the above-mentioned window 51 are made crooked with the above-mentioned precision pressing machine, in the direction which intersects perpendicularly with the above-mentioned plate 50, as shown in drawing 4 (C) and (B), and there is the method of forming the flections 53a and 52a in the above-mentioned frame 53 and the tongue 52.

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**EFFECT OF THE INVENTION**

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[Effect of the Invention] As mentioned above, so that clearly the manufacturing method of the ribbon spring for one way clutches of an invention of claim 1, Even if a barricade occurs in the above-mentioned edges-on-both-sides part when the above-mentioned band-like plate is formed of a slitting machine since the edges-on-both-sides part of the plate which extends in band-like is excised with a pressing machine, the above-mentioned barricade is removable at the time of excision by the above-mentioned pressing machine.

[0042] Therefore, at the time of delivery of the above-mentioned band-like plate, a barricade can be prevented from being caught and a band-like plate can be prevented from being distorted. Since delivery of the above-mentioned band-like plate becomes smooth, the position which a window and tongue pierce with a pressing machine can be made exact.

[0043] The manufacturing method of the ribbon spring of an invention of claim 2 excises the edges-on-both-sides part of the plate which extends in band-like so that the crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate may be formed with a pressing machine. Therefore, it can be made easy to form a lateral crevice in the vertical window frame of a ribbon spring, and for the rigidity of a ribbon spring to become small, and to bend to ring shape. Therefore, according to the invention of claim 2, the inclusion to a one way clutch can manufacture an easy ribbon spring. According to the above-mentioned invention, since the rigidity of a ribbon spring becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state can be improved. So that the excision leader or excision trailer which excises the edges-on-both-sides part of the plate which extends in the above-mentioned band-like one with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice. One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction can be eliminated.

[0044] Even if the barricade has occurred in the above-mentioned edges-on-both-sides part when the above-mentioned band-like plate is formed of a slitting machine since the edges-on-both-sides part of the plate which extends in band-like is excised with a pressing machine, the manufacturing method of the ribbon spring of an invention of claim 3 can be removed when excising the above-mentioned barricade with the above-mentioned pressing machine. Therefore, at the time of delivery of the above-mentioned band-like plate, a barricade can be prevented from being caught and a band-like plate can be prevented from being distorted. Since delivery of the above-mentioned band-like plate becomes smooth, the position which pierces a window and tongue with a pressing machine can be made exact.

[0045] The invention of claim 3 excises between the edges-on-both-sides parts of the above-mentioned band-like plate to slit shape with a pressing machine, forms at least one slit shape

removal part prolonged in the direction to which the above-mentioned plate extends, and forms simultaneously the lobe of the double row prolonged in the direction to which the above-mentioned band-like plate extends. And since a window and tongue are formed in the lobe of this double row and two or more ribbon springs are formed simultaneously, the completed amount per unit time can be improved.

[0046]The invention of claim 4 excises the edges-on-both-sides part of the plate which extends in band-like so that the crevice which became depressed inside from the outside of the above-mentioned transverse direction in the plate may be formed in the invention of claim 3 with a pressing machine. It excises to the slit shape containing the heights which projected the portion between the edges-on-both-sides parts of the above-mentioned band-like plate in the transverse direction, a slit shape removal part is formed, and the crevice which became depressed in the transverse direction in both sides of the above-mentioned lobe is formed. Therefore, according to the invention of claim 4, a lateral crevice is formed in the vertical window frame of a ribbon spring, flexural rigidity of a ribbon spring can be made small, and it becomes easy to bend to ring shape. Therefore, according to the invention of claim 4, the inclusion to a one way clutch can manufacture an easy ribbon spring. Since the flexural rigidity of a ribbon spring becomes small, the overhang to the diameter direction after including in a one way clutch can be suppressed, and the deviation from circular form of the ribbon spring in an inclusion state can be raised. So that the excision leader or excision trailer which excises the portion between the edges-on-both-sides part of the plate which extends in the above-mentioned band-like one, and the above-mentioned edges-on-both-sides part with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice. One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction can be eliminated.

[0047]The edges-on-both-sides part into which the ribbon spring of an invention of claim 5 inserts a window is formed by excising the lateral part which adjoined the outside of the above-mentioned edges-on-both-sides part with a pressing machine. Therefore, even if the above-mentioned lateral part has a barricade, the above-mentioned barricade is removable at the time of excision by the above-mentioned pressing machine. That is, since the above-mentioned ribbon spring can remove a barricade with a pressing machine at the time of the manufacture, connection of the barricade at the time of manufacture does not produce it. Therefore, the distortion at the time of manufacture resulting from connection of the above-mentioned barricade and degradation of process tolerance can be prevented.

[0048]Since the crevice hollow inside is formed in the above-mentioned edges-on-both-sides part, the flexural rigidity of a ribbon spring becomes small and it becomes easy to bend the ribbon spring of an invention of claim 6 to ring shape. Therefore, the inclusion to a one way clutch can be made easy, and it is \*\*. Since flexural rigidity becomes small, the overhang to the diameter direction after including in a one way clutch can be suppressed, and the deviation from circular form in an inclusion state can be improved. So that the excision leader or excision trailer which excises the above-mentioned lateral part with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice. One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction will be lost. Therefore, a barricade can be prevented from occurring in a edges-on-both-sides part.

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## TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]however -- the manufacturing method of the above-mentioned conventional ribbon spring for one way clutches -- the above -- when a slitting machine cuts a broad plate long and slender, a barricade occurs, and a barricade arises in the edges-on-both-sides part of the above-mentioned band-like plate 50. For this reason, when the above-mentioned band-like plate 50 is introduced into the above-mentioned precision pressing machine and passes around, there is a problem that the barricade produced in the above-mentioned edges-on-both-sides part may be caught in the guide part of a passing <a thing> on device, etc., and distortion may arise in the completed ribbon spring.

[0004]When the above-mentioned barricade is caught, the problem that it becomes less smooth and the window 51 by a pressing machine and the formation accuracy of the tongue 52 worsen also has delivery.

[0005]Then, the purpose of this invention is to provide a ribbon spring for one way clutches which can prevent a barricade occurring at the time of manufacture, and a manufacturing method for the same.

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**MEANS**

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[Means for Solving the Problem] In order to attain the above-mentioned purpose, a manufacturing method of a ribbon spring for one way clutches of the invention according to claim 1, In a manufacturing method of a ribbon spring for one way clutches which has two or more windows in which an engaging member arranged between an outer ring of spiral wound gasket and an inner ring is inserted, and the tongue which energizes the above-mentioned engaging member to one way, With a pressing machine, pierce a center section of the band-like plate which excised a edges-on-both-sides part of a plate which extends in band-like with a pressing machine and from which the above-mentioned edges-on-both-sides part was excised, and A window, Tongue projected to the above-mentioned lengthwise direction from a side window frame prolonged in a transverse direction which intersects a lengthwise direction where the above-mentioned plate extends is formed, A vertical window frame and the above-mentioned tongue which are prolonged in the above-mentioned lengthwise direction are made crooked to an abbreviated perpendicular direction to a flat surface where the above-mentioned plate extends, and it is characterized by forming a flection in the above-mentioned vertical window frame and tongue.

[0006] A manufacturing method of a ribbon spring for one way clutches of an invention of claim 2, In a manufacturing method of the ribbon spring for one way clutches according to claim 1, it is characterized by excising with a pressing machine so that a crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate about a edges-on-both-sides part of a plate which extends in the above-mentioned band-like one may be formed.

[0007] A manufacturing method of a ribbon spring for one way clutches of an invention of claim 3, In a manufacturing method of a ribbon spring for one way clutches which has two or more windows in which an engaging member arranged between an outer ring of spiral wound gasket and an inner ring is inserted, and the tongue which energizes the above-mentioned engaging member to one way, Excise a edges-on-both-sides part of a plate which extends in band-like with a pressing machine, and a portion between edges-on-both-sides parts of the above-mentioned band-like plate is excised to slit shape of a lengthwise direction with a pressing machine, At least one slit shape removal part prolonged in a lengthwise direction where the above-mentioned plate is prolonged is formed, With a pressing machine, form a lobe of a double row prolonged in a lengthwise direction where the above-mentioned band-like plate is prolonged, pierce simultaneously two or more center sections of the lobe of the above-mentioned double row, and Two or more windows, Two or more tongues projected to the above-mentioned lengthwise direction from a side window frame prolonged in a transverse direction which intersects a lengthwise direction where the above-mentioned plate is prolonged are formed, A vertical window frame and the above-mentioned tongue which are prolonged in the above-mentioned lengthwise direction are made crooked to an abbreviated perpendicular direction to a flat surface where the above-mentioned plate extends, and it is characterized by forming a flection in the above-mentioned vertical window frame and tongue.

[0008]A manufacturing method of a ribbon spring for one way clutches of an invention of claim 4, In a manufacturing method of the ribbon spring for one way clutches according to claim 3, It excises with a pressing machine so that a crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate about a edges-on-both-sides part of a plate which extends in the above-mentioned band-like one may be formed, It is characterized by excising to slit shape containing heights which projected a portion between edges-on-both-sides parts of the above-mentioned band-like plate in a transverse direction, forming the slit shape above-mentioned removal part, and forming a crevice which became depressed in a transverse direction in both sides of the above-mentioned lobe.

[0009]A ribbon spring for one way clutches of an invention of claim 5, In a ribbon spring for one way clutches which has two or more windows in which an engaging member arranged between an outer ring of spiral wound gasket and an inner ring is inserted, and the tongue which energizes the above-mentioned engaging member to one way, A edges-on-both-sides part which sandwiches the above-mentioned window is characterized by being formed by excising a lateral part which adjoined the outside of the above-mentioned edges-on-both-sides part with a pressing machine.

[0010]A ribbon spring for one way clutches of an invention of claim 6 is characterized by forming a crevice which became depressed inside in the above-mentioned edges-on-both-sides part in the ribbon spring for one way clutches according to claim 5.

[0011]

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**OPERATION**

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[Function]According to the manufacturing method of the ribbon spring of an invention of claim 1, even if the barricade has occurred in the above-mentioned edges-on-both-sides part when the above-mentioned band-like plate is formed of a slitting machine since the edges-on-both-sides part of the plate which extends in band-like is excised with a pressing machine, the above-mentioned barricade is removed at the time of excision by the above-mentioned pressing machine.

[0012]Therefore, at the time of delivery of the above-mentioned band-like plate, it is lost that a barricade is caught and a band-like plate is not distorted. Since delivery of the above-mentioned band-like plate becomes smooth, the position by which a window and tongue are pierced with a pressing machine becomes exact.

[0013]When excising the edges-on-both-sides part of the plate which extends in the above-mentioned band-like one with a pressing machine according to the manufacturing method of the ribbon spring of an invention of claim 2, the crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate is formed. Therefore, a lateral crevice is formed in the vertical window frame of a ribbon spring, the flexural rigidity of a ribbon spring becomes small, and it becomes easy to bend to ring shape. Therefore, according to the invention of claim 2, a ribbon spring with easy inclusion to a one way clutch is manufactured. Since the flexural rigidity of a ribbon spring becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state improves. So that the excision leader or excision trailer which excises the edges-on-both-sides part of the plate which extends in the above-mentioned band-like one with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice, One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction will be lost. That is, tolerance level [ as opposed to a position gap of the above-mentioned removal part only in the part to which the above-mentioned crevice has become depressed in the transverse direction ] spreads.

[0014]Even if the barricade has occurred in the above-mentioned edges-on-both-sides part when the above-mentioned band-like plate is formed of a slitting machine since the manufacturing method of the ribbon spring of an invention of claim 3 excises the edges-on-both-sides part of the plate which extends in band-like with a pressing machine, the above-mentioned barricade is removed at the time of excision by the above-mentioned pressing machine. Therefore, at the time of delivery of the above-mentioned band-like plate, it is lost that a barricade is caught and a band-like plate is not distorted. Since delivery of the above-mentioned band-like plate becomes smooth, the position by which a window and tongue are pierced with a pressing machine becomes exact.

[0015]The invention of claim 3 excises between the edges-on-both-sides parts of the above-mentioned band-like plate to slit shape with a pressing machine, forms at least one slit shape

removal part prolonged in the direction to which the above-mentioned plate extends, and forms simultaneously the lobe of the double row prolonged in the direction to which the above-mentioned band-like plate extends. And since a window and tongue are formed in the lobe of this double row and two or more ribbon springs are formed simultaneously, two or more ribbon springs are manufactured simultaneously, and the completed amount per unit time improves.

[0016]When the invention of claim 4 excises the edges-on-both-sides part of the plate which extends in band-like with a pressing machine in the invention of claim 3, The crevice which became depressed inside from the outside of the above-mentioned transverse direction in the above-mentioned plate is formed, slit shape containing the heights which projected the slit shape removal part in the transverse direction is used, and the crevice which became depressed in the transverse direction in the above-mentioned lobe is formed. Therefore, a lateral crevice is formed in the vertical window frame of a ribbon spring, the flexural rigidity of a ribbon spring becomes small, and it becomes easy to bend to ring shape. Therefore, the inclusion to a one way clutch becomes easy. Since flexural rigidity becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state improves. So that the excision leader or excision trailer which excises the portion between the edges-on-both-sides part of the plate which extends in the above-mentioned band-like one, and the above-mentioned edges-on-both-sides part with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice, One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction will be lost.

[0017]The edges-on-both-sides part into which the ribbon spring of an invention of claim 5 inserts a window is formed by excising the lateral part which adjoined the outside of the above-mentioned edges-on-both-sides part with a pressing machine. Therefore, even if the above-mentioned lateral part has a barricade, the above-mentioned barricade is removed at the time of excision by the above-mentioned pressing machine.

[0018]That is, since the barricade is removed by the pressing machine at the time of the manufacture, connection of the barricade at the time of manufacture does not produce the above-mentioned ribbon spring. Therefore, the distortion at the time of manufacture resulting from connection of the above-mentioned barricade and degradation of process tolerance are prevented.

[0019]Since the crevice hollow inside is formed in the above-mentioned edges-on-both-sides part, the flexural rigidity of a ribbon spring becomes small and it becomes easy to bend the ribbon spring of an invention of claim 6 to ring shape. Therefore, the inclusion to a one way clutch becomes easy. Since flexural rigidity becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state improves. So that the excision leader or excision trailer which excises the above-mentioned lateral part with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice and an excision trailer and the following excision leader may lap in the above-mentioned crevice, One by one, if the above-mentioned edges-on-both-sides part is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the above-mentioned removal part in every direction will be lost. Therefore, it prevents a barricade occurring in a edges-on-both-sides part.

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**EXAMPLE**

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[Example]Hereafter, the example of a graphic display of this invention explains in detail.

[0021]The example of the manufacturing method of the ribbon spring for one way clutches of this invention is described referring to drawing 1 (A). This example excises the edges-on-both-sides parts 2 and 2 with a pressing machine, passing around the plate 1 which extends in band-like [ which was first cut long and slender by the slitting machine ] rightward [ of drawing 1 (A) ]. Excision by this pressing machine is performed so that the crevices 3 and 3 which became depressed inside from the outside of the direction to which the plate 1 extends in the above-mentioned plate 1, and a right-angled transverse direction may be formed.

[0022]Next, the center section of the plate 1 from which the above-mentioned edges-on-both-sides parts 2 and 2 were excised is pierced with a pressing machine, and the tongue 7 projected to the lengthwise direction from the window 5 and the side window frame 6 prolonged in the above-mentioned transverse direction is formed.

[0023]Next, the vertical window frames 8 and 8 and the tongue 7 which are prolonged in a lengthwise direction are made perpendicularly crooked so much at the flat surface at which the plate 1 extends, and the flections 8a, 8a, and 7a are formed in the above-mentioned vertical window frames 8 and 8 and the tongue 7.

[0024]Two or more engaging members (not shown) arranged between an outer ring of spiral wound gasket and an inner ring are inserted in the above-mentioned window 5, and the above-mentioned engaging member is energized by the engaging direction by the above-mentioned flection 7a.

[0025]According to the above-mentioned manufacturing method, even if the barricade has occurred in the edges-on-both-sides part 2 when the plate 1 is formed of a slitting machine since the edges-on-both-sides part 2 of the plate 1 which extends in band-like is excised with a pressing machine, the above-mentioned barricade is removed at the time of excision by the above-mentioned pressing machine. Therefore, at the time of passing <a thing> on of the above-mentioned band-like plate 1, it is lost that a barricade is caught in the inside of the proposal of a feed gear, etc., and the band-like plate 1 can be prevented from being distorted. Since delivery of the above-mentioned band-like plate 1 becomes smooth, the punching position of the window 5 by a pressing machine and the tongue 7 can be made exact.

[0026]Since excision by the above-mentioned pressing machine is performed so that the crevices 3 and 3 which became depressed inside from the outside of the direction to which the plate 1 extends in the above-mentioned plate 1, and a right-angled transverse direction may be formed, the crevice 3 which became depressed in the vertical window frame 8 of the completed ribbon spring at the transverse direction inside is formed. Therefore, the flexural rigidity of a ribbon spring becomes small and it becomes easy to bend to ring shape. Therefore, according to the above-mentioned example, the inclusion to a one way clutch can form an easy ribbon spring. Since the flexural rigidity of a ribbon spring becomes small, the overhang to the diameter direction after including in a one way clutch is suppressed, and the deviation from circular form in an inclusion state improves.

[0027]So that the excision leader or excision trailer which excises the edges-on-both-sides part 2 of the plate 1 which extends in the above-mentioned band-like one with a pressing machine may be made into the convex configuration corresponding to the above-mentioned crevice 3 and an excision trailer and the following excision leader may lap in the above-mentioned crevice 3, One by one, if the above-mentioned edges-on-both-sides part 2 is excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the portion to excise in every direction are lost, and generating of a barricade can be prevented.

[0028]Next, the 2nd example of the manufacturing method of the ribbon spring for one way clutches of this invention is described, referring to drawing 1 (B).

[0029]This 2nd example excises the edges-on-both-sides parts 12 and 12 with a pressing machine, passing around the plate 11 which extends in band-like [ which was first cut long and slender by the slitting machine ] rightward [ of drawing 1 (B) ]. This excision is performed so that the crevices 13 and 13 which became depressed inside from the outside of the direction to which the plate 11 extends in the above-mentioned plate 11, are righted to the outside.

extends in the above-mentioned plate 11, and a right-angled transverse direction may be formed. [see col. 11, line 11, in the title.]

[0030] and it excises to the slit shape containing the heights which projected between excision of the above-mentioned edges-on-both-sides parts 12 and 12, simultaneously the edges-on-both-sides parts 12 and 12 of the above-mentioned band-like plate 11 in the transverse direction with the pressing machine, and the slit shape removal part 14 prolonged in the lengthwise direction where the above-mentioned plate 11 is prolonged is formed. By forming this slit shape removal part 14, the lobes 19 and 19 of two rows by which the crevices 13 and 20 hollow in the transverse direction were formed in both sides are formed.

[0031]Next, the center section of the above-mentioned lobe 19 is pierced with a pressing machine, and the tongue 17 projected to the lengthwise direction from the window 15 and the side window frame 16 prolonged in a transverse direction is formed.

[0032]Next, the vertical window frame 18 and the tongue 17 which are prolonged in a lengthwise direction are made crooked to an abbreviated perpendicular direction to the flat surface where the above-mentioned plate 11 extends, and the flections 18a and 17a are formed in the vertical window frame 18 and the tongue 17.

[0033]According to the manufacturing method of the 2nd example of the above, among the edges-on-both-sides parts 12 and 12 of the band-like plate 11, Since form the slit shape removal part 14, prolonged in a lengthwise direction, the lobes 19 and 19 of two rows are formed simultaneously, the windows 15 and 15 and the tongues 17 and 17 are formed in these lobes 19 and 19 of two rows and two ribbon springs are formed simultaneously, the completed amount per unit time can be raised.

Therefore, the cost cut of a ribbon spring can be aimed at.

[0034] The elements on larger scale of the ribbon spring for one way clutches manufactured in the 2nd example of the above are shown in drawing 2 (A). The ribbon spring shown in drawing 2 (A) is an example of the ribbon spring of this invention. This ribbon spring is formed when the side edge part 12 of the outside of the vertical window frames 18 and 18 and the slit shape removal part 14 excise with a pressing machine. Therefore, even if a barricade is in the side edge part 12 of the above-mentioned outside, the above-mentioned barricade is removed at the time of excision by the above-mentioned pressing machine. That is, since the barricade is removed by the pressing machine at the time of the manufacture, connection of the barricade at the time of manufacture does not produce the above-mentioned ribbon spring. Therefore, the distortion at the time of manufacture resulting from connection of the above-mentioned barricade and degradation of process tolerance can be eliminated, and dimensional accuracy becomes high. Since the crevices 13 and 20 are formed in the vertical window frames 18 and 18, flexural rigidity becomes small and it becomes easy to bend the above-mentioned ribbon spring to ring shape. Therefore, the inclusion to a one way clutch becomes easy. Since flexural rigidity becomes small, the overhang to the diameter direction after including in one way clutch is suppressed, and the deviation from circular form in an inclusion state can be improved. The excision leader or excision trailer which excises the portion between the edges-on-

both-sides part 12 of the plate 11 which extends in the above-mentioned band-like one, and the above-mentioned edges-on-both-sides parts 12 and 12 with a pressing machine is made into the convex configuration corresponding to the above-mentioned crevices 13 and 20, So that an excision trailer and the following excision leader may lap in the above-mentioned crevices 13 and 20, One by one, if the above-mentioned edges-on-both-sides part 12 and the slit shape removal part 14 are excised, the excision remnants between the excision trailer and excision leader resulting from a position gap of the direction of the portions 12 and 14 to excise in every direction are lost, and generating of a barricade can be prevented.

[0035]Although only the one above-mentioned slit shape removal part 14 is formed and two ribbon springs were simultaneously produced in the manufacturing method of the 2nd example of the above, the two or more above-mentioned slit shape removal parts are formed, and it may be made to produce three or more ribbon springs simultaneously. In this case, the completed amount per unit time of a ribbon spring can be raised further.

[0036]Although excision of the edges-on-both-sides parts 12 and 12 and formation of the slit shape removal part 14 were simultaneously performed in the manufacturing method of the 2nd example of the above, The edges-on-both-sides parts 12 and 12 are excised, after passing the plate 11 around, the slit shape removal part 14 may be formed, and the slit shape removal part 14 may be formed conversely, and after passing the plate 11 around, the edges-on-both-sides parts 12 and 12 may be excised.

[0037]In the 1st and 2nd example of the above, when the delivery phase of the plate 11 was the same, performed formation of the flections 8a and 18a of the vertical window frames 8 and 18, and formation of the flections 7a and 17a of the tongues 7 and 17, but, the delivery phases of the plate 11 differ formation of the flection of a vertical window frame, and formation of the flection of tongue --- it may carry out for solving.

[0038]In the above-mentioned example, the crevices 13 and 20 formed in a vertical window frame were made into the inclined straight line and the crevice across which a curve curve faces, as shown in drawing 3 (F), but it may be made semicircle shape as shown in drawing 3 (A). As shown in drawing 3 (B), one side may make the above-mentioned crevice the right angled triangle shape incised right-angled, and as shown in drawing 3 (C), another side may make the above-mentioned crevice the right angled triangle shape incised right-angled. As shown in drawing 3 (D), it may be made the shape of a half-ellipse. As shown in drawing 3 (E), the above-mentioned crevice may be made into a rectangle.

[0039]As shown in drawing 2 (B), the slit for window pitch adjustment may be formed between windows.

[0040]As the dashed line showed at the right end of drawing 1 (B), when one end cut shape of the two ribbon springs is changed with another side, the difference of the above-mentioned end cut shape can be used for pursuit of a manufacture lot.

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[Translation done.]

**\* NOTICES \***

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

Drawing 1 Drawing 1 (A) is a top view explaining the 1st example of the manufacturing method of the ribbon spring for one way clutches of this invention.

Drawing 1 (B) is a top view explaining the 2nd example of the manufacturing method of the ribbon spring for one way clutches of this invention.

Drawing 2 Drawing 2 (A) is a part plan of the example of the ribbon spring for one way clutches of this invention.

Drawing 2 (B) is a part plan of the modification of the above-mentioned example.

Drawing 3 It is a top view showing the modification of the above-mentioned example selectively.

Drawing 4 Drawing 4 (A) is a part plan explaining the manufacturing method of the conventional ribbon spring for one way clutches, drawing 4 (B) is a sectional view of the tongue of the above-mentioned ribbon spring, and drawing 4 (C) is a sectional view of the vertical window frame of the above-mentioned ribbon spring.

**[Description of Notations]**

1, 11 [ -- A window, 6, 16 / -- A side window frame, 7, 17 / -- Tongue 8, 18 / -- A vertical window frame, 7a 8a, 17a, 18a / -- A flection, 14 / -- Slit shape removal part. ] -- A band-like plate, 2, 12 -- A side edge part, 3, 13, 20 -- A crevice, 5, 15

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**[Translation done.]**

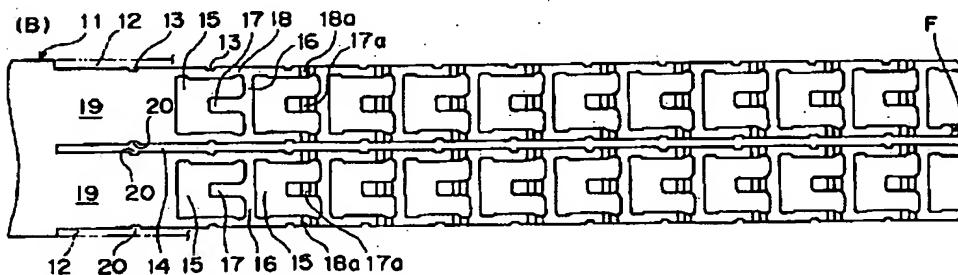
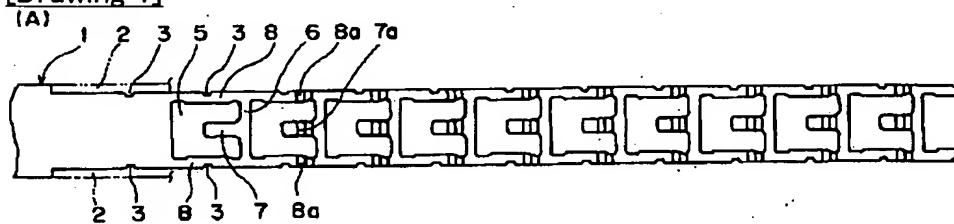
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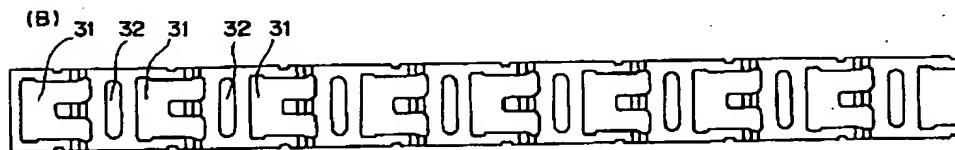
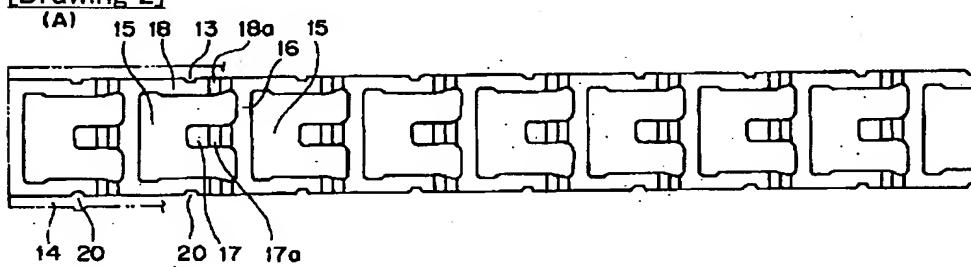
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## DRAWINGS

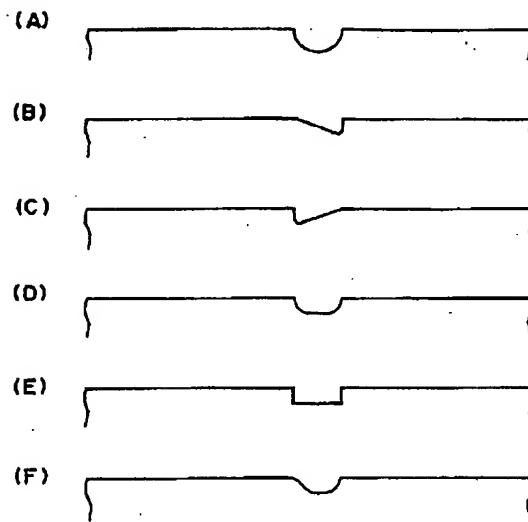
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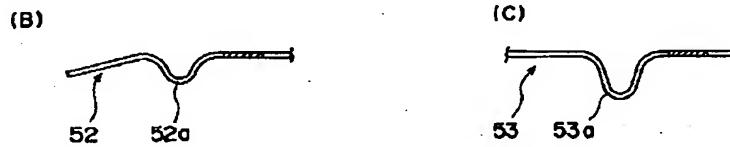
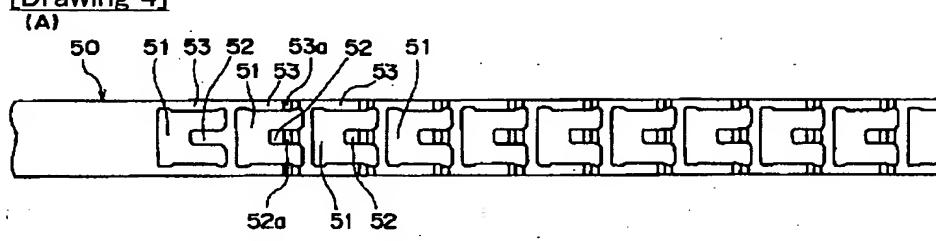
## [Drawing 2]



## [Drawing 3]



## [Drawing 4]



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## **CORRECTION OR AMENDMENT**

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B21D 53/88

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F16D 41/07 D

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[Written amendment]

[Filing date]May 16, Heisei 9

[Amendment 1]

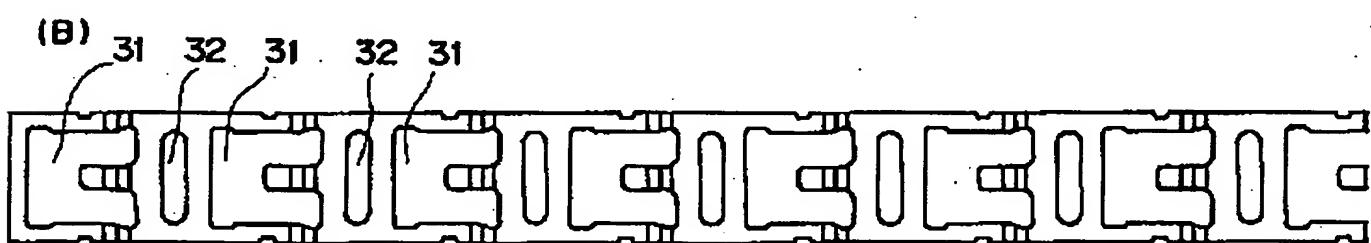
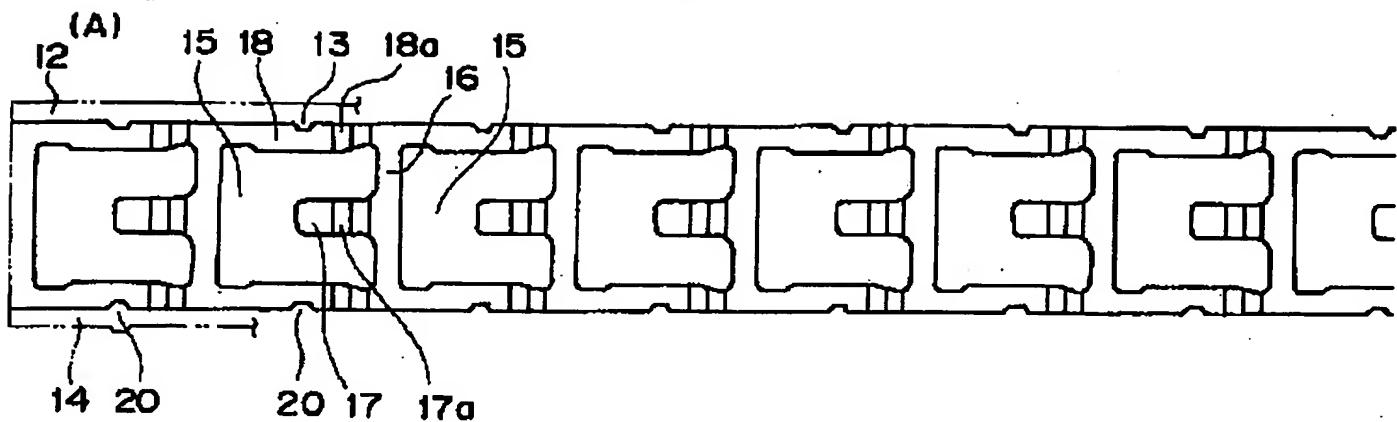
[Document to be Amended]DRAWINGS

[Item(s) to be Amended] Drawing 2

### [Method of Amendment] Change

**[Proposed Amendment]**

[Drawing 2]



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[Translation done.]